

Borehole

51-07-07

Log Event A

Borehole Information

Farm : <u>TX</u>	Tank : <u>TX-107</u>	Site Number : <u>299-W15-190</u>
N-Coord : <u>41,714</u>	W-Coord : <u>75,975</u>	TOC Elevation : <u>670.00</u>
Water Level, ft : <u>99.50</u>	Date Drilled : <u>5/31/1977</u>	

Casing Record

Type : <u>Steel-welded</u>	Thickness : <u>0.280</u>	ID, in. : <u>6</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>100</u>	

Borehole Notes:

According to the driller's records, this borehole was not perforated but grout was added. The driller's record shows an 8-in. starter casing was installed to a depth of 20 ft. Sixty gal of grout was added to the annulus after the 8-in. casing was pulled, and 12.5 gal of grout was added the bottom of the borehole.

Water was detected in the bottom 0.5 ft of the borehole.

The casing thickness is presumed to be 0.280 in., on the basis of published thickness for schedule-40, 6-in. steel tubing.

Equipment Information

Logging System : <u>1</u>	Detector Type : <u>HPGe</u>	Detector Efficiency: <u>35.0 %</u>
Calibration Date : <u>04/1996</u>	Calibration Reference : <u>GJPO-HAN-5</u>	Logging Procedure : <u>P-GJPO-1783</u>

Log Run Information

Log Run Number : <u>1</u>	Log Run Date : <u>4/18/1996</u>	Logging Engineer: <u>Bob Spatz</u>
Start Depth, ft.: <u>99.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>62.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>2</u>	Log Run Date : <u>4/18/1996</u>	Logging Engineer: <u>Bob Spatz</u>
Start Depth, ft.: <u>63.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>0.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>3</u>	Log Run Date : <u>4/19/1996</u>	Logging Engineer: <u>Bob Spatz</u>
Start Depth, ft.: <u>78.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>62.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>



Spectral Gamma-Ray Borehole
Log Data Report

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Log Event A

Analysis Information

Analyst : S.D. Barry

Data Processing Reference : P-GJPO-1787

Analysis Date : 10/10/1996

Analysis Notes :

This borehole was logged with the SGLS in two logging runs and one rerun. The pre-survey field verification spectra from both log runs did not pass the acceptance criteria established for the peak shape and system efficiency. A nonconformance report issued in August 1996 (N-96-05) identified this failure as a power supply malfunction that resulted in a low detector bias voltage supplied to the logging tool. This malfunction occurred during the mornings because of inadequate system warm-up time. This report also documents that concentrations calculated from data collected in the first 2 hours of logging could be systematically underestimated by about 10 percent. Therefore, the data from these log runs (total depth of the borehole) may show a repeatability problem upon relogging of the borehole in the future.

The post-survey field verification spectra for both log runs passed the acceptance criteria for the peak shape and system efficiency, providing evidence the logging system was operating appropriately after an initial warm-up time. Corrections for gain drifts during data collection were not necessary during processing of the data to maintain proper peak identification. The energy calibration and peak-shape calibration from verification spectra that successfully met the established acceptance criteria were used to establish the channel-to-energy parameters used in processing the spectra acquired during the logging operation.

Casing correction factors for a 0.280-in.-thick steel casing were applied during analysis.

The man-made radionuclides Cs-137, Co-60, and Eu-154 were identified in this borehole. The presence of Cs-137 was measured almost continuously from the ground surface to about 20 ft and intermittently to the bottom of the borehole. The maximum Cs-137 concentration was about 10 pCi/g at ground surface. Co-60 was measured continuously from 78 to 50 ft with a maximum concentration of 452 pCi/g at 59.5 ft. Eu-154 was measured almost continuously from 57 to 51 ft with a maximum concentration of 42 pCi/g at 52.5 ft.

A rerun was conducted from 78 to 62 ft and the results from the Co-60, K-40, U-238, and Th-232 were plotted. The calculated concentrations were well within the statistical error range and showed an excellent repeatability of the system.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Report for tank TX-107.

Log Plot Notes:

Separate log plots show the man-made (Cs-137) and the naturally occurring radionuclides (KUT). The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations.

A combination plot includes the man-made, the natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.



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Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A time-sequence plot from July 1983 to June 1994 was created from historical gross gamma log data and is provided with the spectral gamma log data.

A rerun plot was generated for the region between 62 and 78 ft. The radionuclide concentrations shown were calculated using the separate data sets provided by the original and rerun logging runs.